WHAT IS CLAIMED IS:

1. A DNA molecule, which encodes a body weight modulator, or a fragment thereof, selected from the group consisting of:

A. the DNA sequence of FIGURE 1 (SEQ ID NO:1);

B. the DNA sequence of FIGURE 2 (SEQ ID NO:2);

C. DNA sequences that hybridize to any of the foregoing DNA sequences under standard hybridization conditions;

D. DNA sequences that code on expression for an amino acid sequence encoded by any of the foregoing DNA sequences;

E. degenerate variants thereof;

F. alleles thereof; and

G. hybridizable fragments thereof.

2. An isolated nucleic acid molecule, which nucleic acid molecule encodes an ob polypeptide, which polypeptide is characterized by having about 145 to about 167 amino acid residues, being expressed predominantly by adipocytes, and being capable of inducing a reduction of body weight in an animal.

3. The isolated nucleic acid of Claim 2, wherein the ob polypeptide has an amino acid sequence selected from the group consisting of the sequence depicted in Figure 3 (SEQ ID NO:2), Figure 3 from amino acid number 22 to amino acid number 167, Figure 4 (SEQ ID NO:4), Figure 4 from amino acid number 22 to amino acid number 167, Figure 5 (SEQ ID NO:5), Figure 5 from amino acid number 22 to amino acid number 166, Figure 6 (SEQ ID NO:6), and Figure 6 from amino acid number 22 to amino acid number 166.

4. The nucleic acid molecule of Claim 2 selected from the group consisting of DNA and RNA.

5. The nucleic acid molecule of Claim 2, which has a sequence as shown in Figure 1 (SEQ ID NO:1) from nucleotide number 46 to nucleotide number 550.

6. The nucleic acid molecule of Claim 2, which has a sequence as shown in Figure 2 (SEQ ID NO:2) from nucleotide number 46 to nucleotide number 550.

7. The nucleic acid molecule of Claim 1 which is detectably labeled.

8. A cloning vector, which comprises the DNA molecule of Claim 1.

9. An expression vector, which comprises the nucleic acid molecule of Claim 2, operatively associated with an expression control sequence.

10. The expression vector of Claim 9, wherein said expression control sequence is selected from the group consisting of the cytomegalovirus hCMV immediate early gene, the early or late promoters of SV40 or adenovirus, the lac system, the trp system, the TAC system, the TRC system, the major operator and promoter regions of phage λ, the control regions of fd coat protein, the promoter for 3-phosphoglycerate kinase, the promoters of acid phosphatase, and the promoters of the yeast α-mating factors.

11. A probe capable of screening for a nucleic acid encoding an ob polypeptide in alternate species, which probe is a labeled DNA molecule of Claim 1.

12. A unicellular host transfected with a cloning vector of Claim 8.

13. A unicellular host transfected with an expression vector of Claim 9.

14. The unicellular host of Claim 13 wherein the unicellular host is selected from the group consisting of *E. coli*, *Pseudomonas*, *Bacillus*, *Streptomyces*, yeasts,

CHO, R1.1, B-W, L-M, COS 1, COS 7, BSC1, BSC40, and BMT10 cells, plant cells, insect cells, and human cells in tissue culture.

15. An ob polypeptide, which polypeptide is encoded by the DNA molecule of Claim 1.

16. An ob polypeptide, which polypeptide is characterized by having about 145 to about 167 amino acid residues, being expressed predominantly by adipocytes, and being capable of inducing a reduction of body weight in an animal.

17. The ob polypeptide of Claim 16 which has the amino acid sequence shown in Figure 3 (SEQ ID NO:2) or Figure 5 (SEQ ID NO:5).

18. The ob polypeptide of Claim 16 which has the amino acid sequence shown in Figure 4 (SEQ ID NO:4) or Figure 6 (SEQ ID NO:6).

19. An immunogenic fragment of an ob polypeptide, which polypeptide is characterized by having about 160 amino acid residues, being expressed predominantly by adipocytes, and being capable of inducing a reduction of body weight in an animal.

20. The immunogenic fragment of an ob polypeptide of Claim 19, which is selected from the group consisting of

Val-Pro-Ile-Gln-Lys-Val-Gln-Asp-Asp-Thr-Lys-Thr-Leu-Ile-Lys-Thr (SEQ ID NO:18);

Leu-His-Pro-Ile-Leu-Ser-Leu-Ser-Lys-Met-Asp-Gln-Thr-Leu-Ala (SEQ ID NO:19);

Ser-Lys-Ser-Cys-Ser-Leu-Pro-Gln-Thr-Ser-Gly-Leu-Gln-Lys-Pro-Glu-Ser-Leu-Asp (SEQ ID NO:20); and

Ser-Arg-Leu-Gln-Gly-Ser-Leu-Gln-Asp-Ile-Leu-Gln-Gln-Leu-Asp-Val-Ser-Pro-Glu-Cys (SEQ ID NO:21).

21. An antibody to the ob polypeptide of Claim 15.

22. An antibody to the ob polypeptide of Claim 16.

23. A method for preparing an antibody to an ob polypeptide, comprising:

A. conjugating the immunogenic fragment of an ob polypeptide of Claim 19 to a carrier protein;

B. immunizing a host animal with the ob polypeptide fragment-carrier protein conjugate of step A admixed with an adjuvant; and

C. obtaining antibody from the immunized host animal.

24. An antibody to an ob polypeptide prepared according a method comprising:

A. conjugating an immunogenic fragment of an ob polypeptide of Claim 19 to a carrier protein;

B. immunizing a host animal with the ob polypeptide fragment-carrier protein conjugate of step A admixed with an adjuvant; and

C. obtaining antibody from the immunized host animal.

25. The antibody of Claim 21, 22, or 24 comprising a polyclonal antibody.

26. The antibody of Claim 21, 22, or 24 comprising a monoclonal antibody.

27. An immortal cell line that produces a monoclonal antibody according to Claim 26.

28. The antibody of Claim 21, 22, or 24 labeled with a detectable label.

29. The antibody of Claim 28 wherein the label is selected from the group consisting of enzymes, chemicals which fluoresce, and radioactive elements.

30. A method for measuring the presence of an ob polypeptide in a sample, comprising:

A. contacting a sample suspected of containing an ob polypeptide with an antibody that binds to the ob polypeptide under conditions which allow for the formation of reaction complexes comprising the antibody and the ob polypeptide,

B. detecting the formation of reaction complexes comprising the antibody and ob polypeptide in the sample;

in which detection of the formation of reaction complexes indicates the presence of ob polypeptide in the sample.

31. The method of Claim 30 in which the antibody is bound to a solid phase support.

32. The method of Claim 31 which further comprises contacting the sample with a labelled ob polypeptide step (A), and removing unbound substances prior to step (B), and in which the formation of reaction complexes in the sample is detected by observing a decrease in the amount of labelled ob polypeptide in the sample.

33. The method of Claim 31 which further comprises contacting the sample with a labelled antibody in step (A), which labelled antibody is an anti-ob polypeptide antibody, and removing unbound substances prior to step (B), and in which the formation of reaction complexes in the sample is detected by observing an increase in the amount of labelled antibody in the sample.

34. The method of Claim 30 in which an ob polypeptide is bound to a solid phase support.

35. The method of Claim 34 which further comprises contacting the sample with an ob polypeptide in step (A), and removing unbound substances prior to step (B), and in which the antibody is labelled and the formation of reaction complexes

in the sample is detected by observing a decrease in the amount of labelled antibody.

36. A method for evaluating the level of ob polypeptide in a biological sample comprising

A. detecting the formation of reaction complexes in a biological sample according to the method of Claim 30; and

B. evaluating the amount of reaction complexes formed, which amount of reaction complexes corresponds to the level of ob polypeptide in the biological sample.

37. A method for detecting or diagnosing the presence of a disease associated with elevated or decreased levels of ob polypeptide in a mammalian subject comprising:

A. evaluating the level of ob polypeptide in a biological sample from a mammalian subject according to Claim 36; and

B. comparing the level detected in step (A) to a level of ob polypeptide present in normals or in the subject at an earlier time;

in which an increase in the level of ob polypeptide as compared to normal levels indicates a disease associated with elevated levels of ob polypeptide, and decreased level of ob polypeptide as compared to normal levels indicates a disease associated with decreased levels of ob polypeptide.

38. A method for monitoring a therapeutic treatment of a disease associated with elevated or decreased levels of ob polypeptide in a mammalian subject comprising evaluating the levels of ob polypeptide in a series of biological samples obtained at different time points from a mammalian subject undergoing a therapeutic treatment for a disease associated with elevated or decreased levels of ob polypeptide according to the method of Claim 36.

39. The method according to Claim 37 or 38, wherein the disease associated with elevated levels of ob polypeptide is selected from the group consisting of AIDS, cachexia, cancer, and anorexia nervosa.

40. The method according to Claim 37 or 38, wherein the disease associated with decreased levels of ob polypeptide is selected from the group consisting of obesity, Type II diabetes, hypertension, and elevated blood lipids.

41. A test kit for measuring the presence or amount of ob polypeptide in a sample, comprising:

A. an anti-ob polypeptide antibody of Claim 21, 22, or 24;

B. means for detecting binding of the anti-ob polypeptide antibody to ob polypeptide in a sample;

C. other reagents; and

D. directions for use of the kit.

42. A method for changing the body weight of a mammal comprising inhibiting the expression of an ob polypeptide encoded by a nucleic acid of Claim 2.

43. The method according to Claim 42 comprising expressing an antisense nucleic acid molecule hybridizable to a nucleic acid that expresses the ob polypeptide, expressing a ribozyme that cleaves a nucleic acid that expresses the ob polypeptide, administering an antisense nucleic acid molecule hybridizable to a nucleic acid that expresses the ob polypeptide, and administering a ribozyme that cleaves a nucleic acid that expresses the ob polypeptide.

44. A pharmaceutical composition for reducing body weight of an animal comprising the ob polypeptide of Claim 15 and a pharmaceutically acceptable carrier.

45. A pharmaceutical composition for reducing body weight of an animal comprising the ob polypeptide of Claim 16 and a pharmaceutically acceptable carrier.

46. A method for reducing the body weight of an animal comprising administering an amount of a pharmaceutical composition of Claim 45 effective to reduce the body weight of an animal to an animal believed to be in need of decreased body weight.

47. The method according to Claim 46 wherein the animal is a human, and the ob polypeptide is human ob polypeptide.

48. A method for reducing the body weight of a mammal comprising increasing the expression of a protein encoded by the nucleic acid of Claim 2.

49. A pharmaceutical composition for increasing the body weight of an animal comprising an antagonist of an ob polypeptide.

50. The pharmaceutical composition of Claim 49, wherein the antagonist is selected from the group consisting of an antibody that binds to and neutralizes the activity of ob polypeptide, a fragment of the ob polypeptide that binds to but does not activate the ob receptor, and a small molecule antagonist of the ob polypeptide.

51. A method for increasing the body weight of an animal comprising administering an amount of the pharmaceutical composition of Claim 49 effective to cause an increase in body weight to an animal believed to be in need of increased body weight.